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FILLING TREE CAVITIES

J. J. Levison

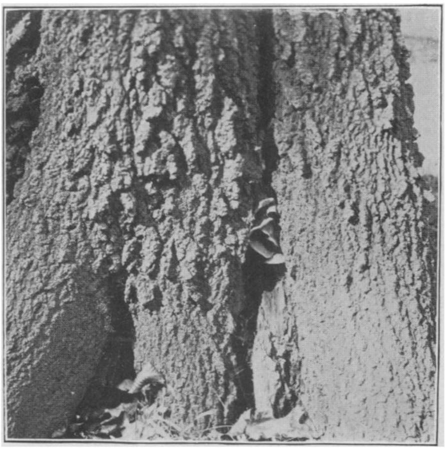
(With Plate 6, Containing Four Figures)

Everyone recognizes the necessity of filling a decayed cavity in a tooth. Everyone knows that the decayed material in the cavity must be removed in order to prevent the destruction of the whole tooth and that the opening must then be filled in order to keep out the further accumulation of injurious substances. Still, there are some who might be surprised to hear of scientific tree "dentistry," or tree filling, although the underlying principles and necessity for such treatment are alike in both human beings and trees.

Cavities in trees are common even in some of the best kept gardens and will always follow the unskilled pruner or the neglected wound. The cavity in itself is not important unless it be a large one, but it is the breeding place which it affords for enemies such as insects and fungi that is highly important and worthy of the most serious consideration in the care of trees. The accumulation of moisture and the exclusion of light and cold which are characteristic of every cavity are the ideal conditions which the spore of a fungus disease seeks. The spores are produced by the millions on all trees attacked by fungi and it is therefore not the least surprising to find that every tree cavity is dangerously exposed to the attacks of fungi and that when a fungus spore does settle in one of these cavities it germinates rapidly under the favorable conditions of food, water, air and warmth, and soon produces a mass of fibers which penetrate the body of the tree. The weakened vitality of the tree, together with the open cavities, will then invite the entrance of many injurious insect pests, so that within a comparatively short time the death of the tree will become inevitable.

A timely cleaning and filling of the cavity, however, would exclude the conditions necessary to the development of disease and would prevent the entrance of new insects and fungi and stop the disease already started from spreading. The filling of a cavity in most cases involves as many problems as the filling of a tooth and does not mean mere stuffing of the cavity with some solid substance. The one about to fill a cavity must know whether the disease has permeated the whole tree or is still in its first stages. He must know whether the disease prefers dead wood or live wood, or both; whether it is apt to attack the neighboring trees of another species, and whether it is preferable to sacrifice the whole limb or tree instead of filling it. He must be able to recognize the presence of the fungus fibers in order to know when to stop cutting into the cavity, and he must know how to destroy the various insect enemies found within the cavity. He must know whether the wood is naturally strong and pliable or soft and brash, in order to determine the extent to which he can dig into the cavity with safety. He must judge whether an ordinary filling will hold or whether there is a call for mechanical devices such as tin plates to hold the filling in a swaying young tree, or iron bars to hold it between two split limbs. Finally, a knowledge of the nature of the species and general condition of the tree in question will be serviceable in deciding the future possibilities of the tree after treatment.

Before filling the cavity, all diseased wood is removed from it with the free use of the knife, chisel or gouge. It is far better to enlarge the cavity by cutting out every bit of diseased wood than it is to leave a smaller hole in an unhealthy state, for any trace of disease left within the cavity will continue its destructive work behind the filling and later on destroy the tree just the same as if there had been no filling at all. Where there are boring larvae or beetles within the cavity, their destruction must be assured before filling is commenced. It frequently happens with large cavities and hollow trunks that the borers are so situated that they cannot be reached individually; in such cases a method of fumigating the cavity has been resorted to by the writer which consists in closing all orifices leading to the cavity with tar paper and then filling it with vapor of hydrocyanic acid gas or that of carbon bisulfid. Either of these gases will kill all animal life and will penetrate the extreme burrows which the operator's syringe



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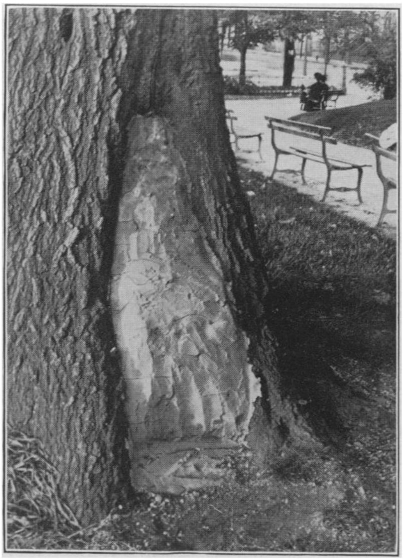

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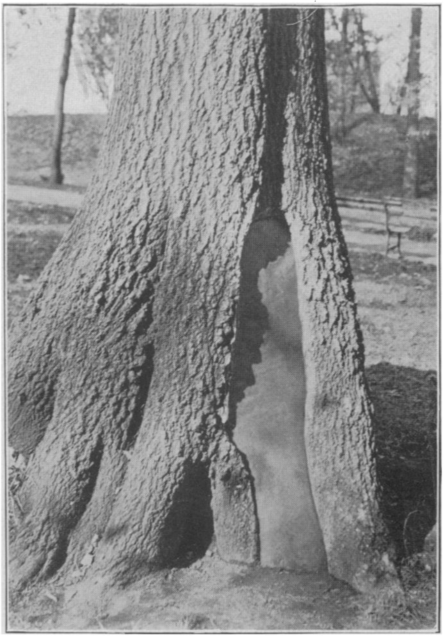

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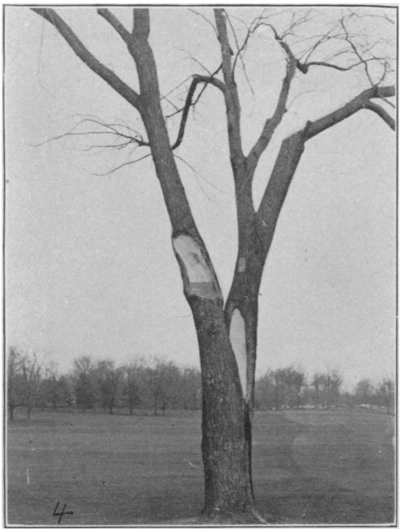

1. AN OAK TRUNK PARTIALLY DECAYED AT THE BASE.
2. THE SAME TRUNK PROPERLY CLEANED OUT AND FILLED.
3. ANOTHER PARTIALLY DECAYED OAK TRUNK IMPROPERLY FILLED.
4. AN ELM WITH LARGE CAVITIES CLEANED AND FILLED.

could never reach or which would otherwise escape his eye. When the cavity is absolutely freed from disease and insects its interior is covered with a coat of white lead paint, which acts as a disinfectant and also helps to hold the filling. The cavity is then solidly filled with bricks, stone and cement, or with charcoal, bricks and cement. The filling is allowed to set and harden and after a day or two covered with coal tar to prevent the weather from cracking the cement. The work can best be done in warm weather. The cement is used mixed with two thirds fine sand, and not only serves as a bed for the bricks and stone but also forms the outer wall of the filling. The exposed face of the filling must not be brought out to the same plane with the outer bark of the tree, but should rather recede a quarter of an inch, so that the living layer or cambium, which is situated immediately below the outer bark, can grow over the cement and cover the whole cavity, if it be a small one, or else grow out sufficiently to overlap the filling and hold it as a frame holds a picture. The growth of this living layer can be much accelerated by cutting around the border of the orifice immediately before the season of growth commences. The substitution of charcoal for a portion of the bricks or stone is advisable in many instances because the coal acts as an antidote against fungi and as an absorbent of moisture. Where a cavity runs down a limb or trunk perpendicularly, a mixture of pitch and sand can be poured down with advantage in place of cement and bricks.

The handling of cavities in this manner is not practiced very extensively in this country, chiefly because the work is not usually done properly and the resulting failures discourage the operators. The cavity is generally not sufficiently cleaned and the disease is allowed to continue its disastrous work behind the filling. The cement is flushed out to the surface of the bark so that within a year or two it either falls out altogether or else is pushed out by the growing cambium forming crevices between the cement and the wall of the cavity. The outer surface of the filling is seldom tarred and is therefore directly exposed to the injurious effects of the weather. The correct method of filling tree cavities has been practiced extensively in Brooklyn for the past two years with excellent results.

BROOKLYN PARK DEPARTMENT.